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STRUCTURAL CARRIER NON-THERMAL PLASMA REACTOR

ABSTRACT OF THE DISCLOSURE

A non-thermal plasma reactor element includes a structural carrier; a thin electrode layer disposed upon the structural carrier; and a thin high k barrier layer disposed upon the electrode layer. Double, single and null dielectric carrier elements are provided. The structural support function for the element is substantially provided by the structural carrier while the dielectric barrier function is substantially provided by the high k barrier layer. This enables optimum utilization of conventional extrusion materials having low-cost, fabricability, mechanical and thermal properties (such as cordierite, mullite, and alumina) as structural carriers. Further, since the reactor capacitance is not dependent on the thickness of the structural carrier, structural carrier thickness is selected based upon mechanical strength and durability requirements of a given system. Electrode layers and high k barrier layers are tailored to have dimensions as thin as possible for the particular NTP reactor application. In a preferred embodiment, a minimal number of structural ligaments are provided, thereby maximizing conversion efficiency while maintaining structural and electrical performance.